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(54) Method and apparatus for matting.

(57) There is disclosed a method for making rubber backed matting comprising placing a rubber sheet/mat assembly between a hot platen and a pressure applying arrangement with the rubber sheet adjacent the hot platen.

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METHOD AND APPARATUS FOR MATTING

This invention relates to the manufacture of rubber-backed mats or carpet.

Such matting is usually made by softening a rubber sheet assembled with a textile fibre mat and compressing the two together between a hot platen and a flexible membrane on the form of an air bag. The arrangement is left under pressure for such time as is required to cure the rubber at its softening temperature. Conventionally, the mat is against the plates and the rubber against the air bag.

We have found, however, that curing times can be very much reduced as compared to this conventional arrangement.

The invention comprises a method for making rubber backed matting comprising placing a rubber sheet/mat assembly between a hot platen and a pressure applying arrangement with the rubber sheet adjacent the hot platen.

The pressure applying arrangement can still comprise a fluid pressure arrangement such as the conventional air bag.

A release material may be placed between the rubber sheet and the hot platen, and the release material may be textured to impart a pattern to the rubber sheet, comprising, for example, a woven glass fibre sheet having a release finish such as polytetrafluoroethylene.

Conventional presses are somewhat complicated affairs in which supports for the air bag and the platen are moved apart to introduce and remove the rubber sheet/mat assembly and moved together to apply the pressure. The present invention provides a simpler arrangement with no need for mechanically movable parts.

The invention also comprises apparatus for making rubber backed matting comprising a hot platen and a pressure applying arrangement comprising a flexible membrane over the platen and adapted to bear down towards the platen whereby to compress together a rubber sheet/mat assembly with the rubber sheet adjacent the hot platen and to maintain a softening/curing temperature for a time sufficient to cure the rubber which has softened and bonded to the mat.

The flexible membrane may be a face of an air bag which is situated above the platen and which raises and lowers pneumatically sufficiently to permit the rubber sheet/mat assembly to be inserted between the membrane and the platen. The bag may be evacuable to raise the platen. Rapid evacuation may be effected by a venturi arrangement.

The apparatus may comprise a laying up table adjacent the platen on which a rubber sheet/mat assembly can be prepared and slid from there in between the platen and membrane. Or a belt feed

of release material may be arranged to carry the rubber sheet/mat assembly in between the platen and the membrane.

Embodiments of apparatus and the method for making rubber backed matting according to the invention will now be described with reference to the accompanying drawings, in which :-

Figure 1 is a side elevation of one apparatus; and

Figure 2 is a side elevation of another apparatus.

The drawings illustrate apparatus for making rubber backed matting comprising a hot platen 11 and a pressure applying arrangement 12 comprising a flexible membrane 13 (shown in full line in retracted condition and in broken line in pressure-applying condition) over the platen 11 and adapted to bear down towards the platen 11 whereby to compress together a rubber sheet/mat assembly 14.

The assembly 14 is seen to a larger thickness scale for clarity) on a laying up table 15 prior to being inserted between the platen 11 and the pressure applying arrangement 12 and has the rubber sheet 16 thereof lowermost with the matting 17 on top. Either side of the assembly 14, however, is a release material 18 comprising a ptfc coated woven glass fibre sheet.

The platen is heated, either electrically or by hot fluid via conduits 19, to a softening temperature for the rubber which is pressed, soft, into the fibre mat 17 and then cured under continued heat and pressure. For nitrile rubber a suitable temperature is 150-160 °C and a suitable time to cure is 5-10 minutes.

The membrane 13 is one wall of an air bag which is supplied with pressure air through a valve 21 under the control of a process timer 22. A suitable pressure is one atmosphere (above atmospheric, that is). A relief valve 23 is provided to protect against over-inflation, the valve 21 itself being set to cut off the supply of pressed air when the required bag pressure is attained. A further valve 24 is operated, again by the process timer 22, to open when pressure is to be removed, and the valve 21 can again be opened to assist exhaustion of air from the bag and reduce its pressure even somewhat below atmospheric by means of a venturi arrangement 25.

In this way, the membrane 13 is raised sufficiently to permit the hot pressed, cured rubber sheet/mat assembly to be removed from between the membrane 12 and platen 11 without the need for any mechanical elevation of the support for the air bag. Essentially, except for the pneumatically

distendable membrane 13, the apparatus comprises no moving parts.

Figure 2 shows an apparatus with a belt feed arrangement 26, the belt 27 being of ptfe coated over glass fibre fabric trained roller 28, one of which can be motor driven under the control of the process timer 22 (Figure 1).

Whilst arrangements have been shown with the air bag on top of a horizontal platen, of course other arrangements in which, for example, the platen may be vertical and the air bag on one side of it, can be envisaged provided suitable arrangements are made for feeding the rubber sheet/mat assembly, and other variations could be introduced without losing the advantages of the invention, primarily seen as a reduction in cycle time because of the faster softening of the rubber by virtue of its adjacency to the platen, but also to be seen in the simplicity of the apparatus and its relatively low cost as compared to conventional presses.

Claims

1. A method for making rubber backed matting comprising placing a rubber sheet/mat assembly between a hot platen and a pressure applying arrangement with the rubber sheet adjacent the hot platen.
2. A method according to claim 1, in which the pressure applying arrangement comprises a fluid pressure arrangement.
3. A method according to claim 2, in which the fluid pressure arrangement comprises an air bag.
4. A method according to any one of claims 1 to 3, in which there is a release material between the rubber sheet and the hot platen.
5. A method according to claim 4, in which the release material is textured to impart a pattern to the rubber sheet.
6. A method according to claim 4 or claim 5, in which the release material comprises a woven glass fibre sheet having a release finish such as p.t.f.e.
7. A method for making rubber backed matting substantially as hereinbefore described with reference to the accompanying drawings.
8. Apparatus for making rubber backed matting comprising a hot platen and a pressure applying arrangement comprising a flexible membrane over the platen and adapted to bear down towards the platen whereby to compress together a rubber sheet/mat assembly with the rubber sheet adjacent the hot platen and to maintain a softening/curing temperature for a time sufficient to cure the rubber which has softened and bonded to the mat.
9. Apparatus according to claim 8, in which the flexible membrane is a face of an air bag which is

situated above the platen and which raises and lowers pneumatically sufficiently to permit the rubber sheet/mat assembly to be inserted between the membrane and the platen.

- 5 10. Apparatus according to claim 9, in which the air bag is evacuable to raise the membrane.
11. Apparatus according to claim 10, in which the evacuation is effected by a venturi arrangement.
- 10 12. Apparatus according to any one of claims 8 to 11, comprising a laying-up table adjacent the platen on which a rubber sheet/mat assembly can be prepared and slid from there in between the platen and membrane.
- 15 13. Apparatus according to any one of claims 8 to 11, comprising a belt feed of release material arranged to carry the rubber sheet/mat assembly in between the platen and the membrane.

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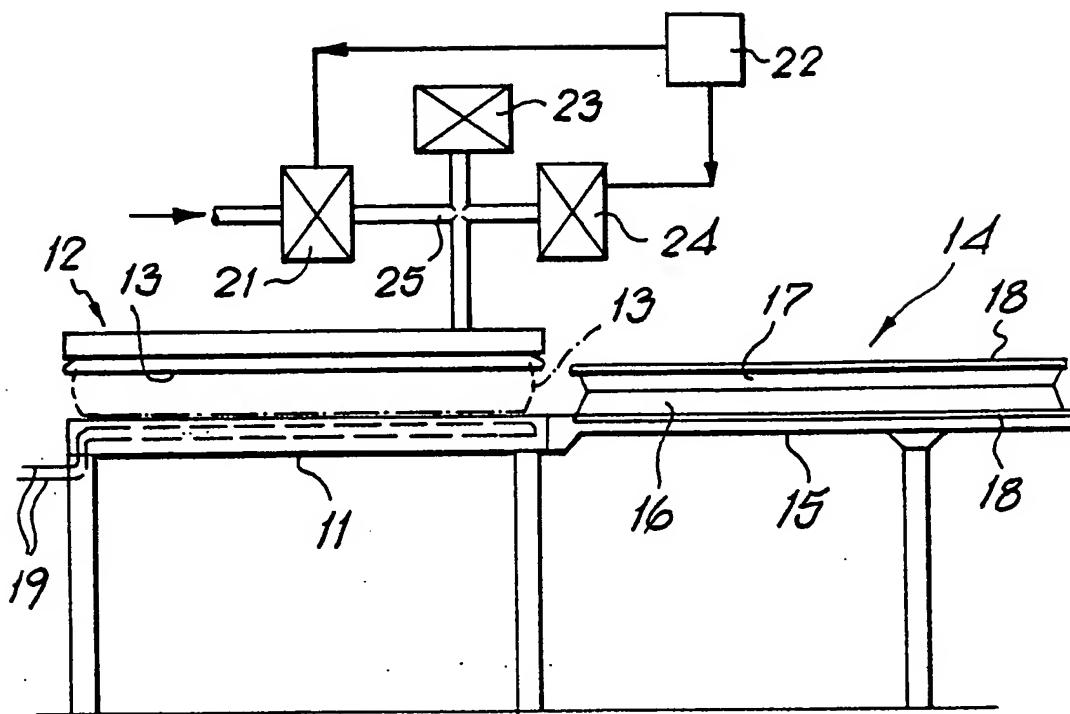


FIG.1

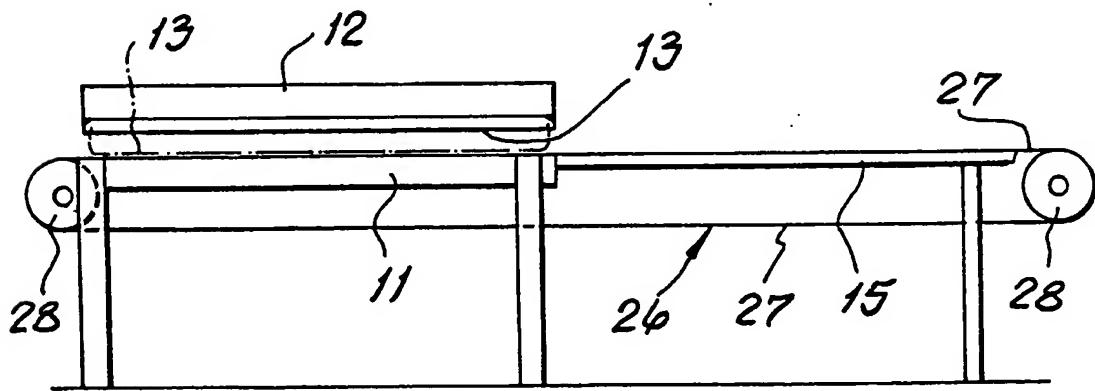


FIG.2